

I CLAIM:

1. A bone screw for compression of a bone, comprising:
a shank including a thread; and
5 a head connected to the shank and configured to exert an axial force selectively on a plurality of spaced regions of the bone that are apposed to the head.
2. The bone screw of claim 1, the head including a lateral surface defining a plurality of ledge structures and one or more intervening surface regions disposed
10 between the ledge structures, wherein the plurality of ledge structures are configured to apply a greater axial force than the one or more intervening surface regions.
3. The bone screw of claim 2, the shank defining an axial vector extending from the shank toward the head, wherein the plurality of ledge structures and the one or
15 more intervening surface regions extend at an angle from the axial vector, and wherein the angle is greater for the plurality of ledge structures than for the one or more intervening surface regions.
4. The bone screw of claim 3, wherein the angle is at least about 90 degrees
20 for the ledge structures.

5. A bone screw for compression of a bone, comprising:
a shank including a thread; and
a head connected to the shank and including a lateral surface defining a plurality of ledge structures disposed circumferentially on the head.

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6. The bone screw of claim 5, wherein the shank has a proximal portion adjacent the head and a distal portion spaced from the head, and wherein the thread is restricted to the distal portion.

10 7. The bone screw of claim 5, wherein the thread defines an opening so that the bone screw is self-tapping.

8. The bone screw of claim 5, wherein the shank includes a tip region configured to cut a hole in the bone as the bone screw is advanced into the bone.

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9. The bone screw of claim 5, wherein the ledge structures are defined by at least one of a plurality of ridges and a plurality of grooves.

10. The bone screw of claim 5, the ledge structures defining spaced
20 circumferential paths, wherein at least one of the ledge structures extends continuously along its circumferential path.

11. The bone screw of claim 10, wherein the at least one ledge structure describes a complete circle.

12. The bone screw of claim 10, wherein the at least one ledge structure
5 describes a portion of a circle.

13. The bone screw of claim 5, wherein the diameter of the plurality of ledge structures decreases successively toward the shank.

10 14. The bone screw of claim 5, wherein the lateral surface generally describes a frustum of a cone.

15. The bone screw of claim 5, wherein the head includes a plurality of steps defined by stepwise decreases in the diameter of the head.

15 16. The bone screw of claim 5, wherein at least one of the plurality of ledge structures is included in an annular tooth formed by flanking surface regions of the lateral surface that join at a rim, the rim being disposed closer to the shank than the flanking surface regions.

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17. The bone screw of claim 5, wherein the shank and the head define opposing ends of the bone screw and further define an axial bore extending between the opposing ends.

5 18. The bone screw of claim 17, wherein the axial bore includes a widened region configured to receive a tool that engages the head.

19. The bone screw of claim 5, wherein the head is fixedly connected to the shank.

10 20. The bone screw of claim 5, wherein the head is rotatably and/or slidably connected to the shank.

21. A bone screw for compression of a bone, comprising:
15 a shank including a proximal region, a distal region, and a thread restricted to the distal region; and

a head connected to the shank and spaced from the thread by the proximal region, the head including a lateral surface defining a plurality of spaced ledge structures disposed on the head, each ledge structure describing at least portion of a
20 circle.

22. The bone screw of claim 21, wherein the ledge structures are defined by at least one of a plurality of ridges and a plurality of grooves.

23. The bone screw of claim 21, wherein the ledge structures describe
5 complete circles.

24. The bone screw of claim 21, wherein the head includes a plurality of steps defined by stepwise decreases in the diameter of the head.

10 25. The bone screw of claim 21, wherein the head is generally frustoconical in shape.

26. The bone screw of claim 21, the head having an aspect ratio defined by the axial length of the head relative to the maximum diameter of the head, wherein the
15 aspect ratio is at least 1:1.

27. A bone screw for compression of a bone, comprising:
a shank including a thread; and
a head connected rotatably to the shank and configured to follow the shank into
20 the bone, the head having an aspect ratio defined by its axial length relative to its maximum diameter, the aspect ratio being at least 1:1.

28. A method of compressing a bone with a bone screw, comprising:

forming a hole in the bone;

selecting a bone screw having a shank and a head; and

advancing first the shank and then the head of the bone screw into the hole so

5 that the head contacts and applies an axial force selectively to a plurality of spaced regions of the bone, such that portions of the bone near the head are compressed toward portions of the bone near the shank.

29. The method of claim 28, the spaced regions being separated by

10 interposed regions of the bone, wherein the step of advancing also applies an axial force to the interposed regions, the axial force applied to the interposed regions being less than the axial force applied to the plurality of spaced regions.

30. The method of claim 28, the spaced regions being separated by

15 interposed regions of the bone, wherein the step of advancing also applies no substantial axial force to the interposed regions.

31. The method of claim 28, wherein the step of forming a hole includes

forming a bore and a counterbore, and wherein the step of advancing the bone screw

20 disposes the head and the shank at least substantially in the counterbore and the bore, respectively.

32. The method of claim 28, wherein the step of forming a hole is performed by the step of advancing a bone screw.

33. The method of claim 28, wherein the portions of the bone near the head
5 and the portions of the bone near the shank are initially separated by a fracture in the bone.